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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/518,193	08/22/2005	Caiguo Gong	2002B093	5600
23455 7590 01/20/2010 EXXONMOBIL CHEMICAL COMPANY 5200 BAYWAY DRIVE P.O. BOX 2149 BAYTOWN, TX 77522-2149				
EXAMINER				
NERANGIS, VICKIE MARIE				
ART UNIT		PAPER NUMBER		
1796				
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01/20/2010		PAPER		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/518,193

Applicant(s)

GONG ET AL.

Examiner

Vickey Nerangis

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Period for Reply -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 October 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) See Continuation Sheet is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 5, 8, 10, 11, 13, 16, 19, 20, 22, 23, 27, 29, 30, 32, 34-37, 39, 42, 45 and 72-76 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-940)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

Continuation of Disposition of Claims: Claims pending in the application are 1,5,8,10,11,13,16,19,20,22,23,27,29,30,32,34-37,39,42,45 and 72-76.

DETAILED ACTION

1. Please note that the examiner of record has changed. The new examiner is Vickey Nerangis.
2. It is noted that claim 1 is non-compliant given that single brackets are used to delete the term "and." In order to compliantly delete the term "and," double brackets should have been used. In the interest of compact prosecution, the amendment filed on 10/23/2009 is examined.
3. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior office action.
4. New grounds of rejection are set forth below. Thus, *a 2nd non-final Office action is set forth as follows.*

Claim Objections

5. Claims 30, 32, and 35 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Regarding claims 30 and 32, the limitations in these claims are included in claim 22. Regarding claim 35, claim 22 requires the presence of three monomers (olefin derived units, styrenic derived units, and substituted styrenic derived units) but all the polymers listed in claim 23 either have only one or two of the monomers.
6. Claim 72 is objected to because "dipenyl" is a misspelling of "diphenyl."

Claim Rejections - 35 USC § 112

7. Claims 1, 5, 8, 10, 11, 13, 16, 19, 20, 22, 23, 27, 29, 30, 32, 34-37, 39, 42, and 45 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

With respect to claims 1 and 22, it is unclear whether the nonhalogenated elastomer comprising each of C₂-C₁₀ olefin derived units, styrenic derived units, *and* substituted styrenic derived units is intended to actually contains all three comonomers. Although the claim clearly states this, confusion arises from dependent claims 19 and 35 which include specific copolymers that do not include each of the comonomers. In the interest of compact prosecution, the nanhalogented elastomer is being read as one with C₂-C₁₀ olefin derived units and styrenic derived *and/or* substituted styrenic derived units.

With respect to claims 1, 22, and 32, it is unclear whether the amounts of styrenic derived units include both styrenic derived units and substituted styrenic derived units.

With respect to claims 1, 16, 22, 23, 27, 29, 30, 35, 42, and 45, the claims appear to improperly recite a Markush group. Consequently, it is impossible to determine which elements of the group are required by the claims. When materials recited in a claim are so related as to constitute a proper Markush group, they may be recited in the conventional manner, or alternatively. For example, if “wherein R is a material selected from the group consisting of A, B, C and D” is a proper limitation, then “wherein R is A, B, C or D” shall also be considered proper (emphasis added). See MPEP § 2173.05(h).

With respect to claims 5, 8, 10, 11, 13, 19, 20, 34, 36, 37, and 39, they are rejected for being dependent on a rejected claim.

Claim Rejections - 35 USC § 103

8. Claims 1, 5, 8, 10, 11, 13, 16, 19, 20, 22, 23, 27, 29, 30, 32, 34-37, 39, 42, 45, and 72-76 are rejected under 35 U.S.C. 103(a) as being unpatentable over Arjunan (US 5,700,871) in view of Elpass (US 5,807,629)

Arjunan discloses a composition comprising an acid-grafted polymer of an isomonooolefin (preferably isobutylene) and an alkylstyrene (preferably in an amount of 0.5-20 mol % paramethyl styrene, col. 4, lines 11-12) that is grafted with carboxylic acid derivatives such as dialkyl maleate and alkyl maleate (col. 4, lines 38-67) having preferred molecular weight of 300,000-2,000,000 (col. 4, lines 21-22) in an amount of 0.15-0.005 mmole per gram of the acid-grafted polymer (col. 5, lines 1-6) that is grafted onto polymer with an organic peroxide (col. 5, line 14) such as diacyl peroxides (col. 5, lines 20-23); an elastomer such as polyisoprene, *inter alia* (col. 6, lines 35-63); and filler such as clay (col. 7, line 48) and carbon black (col. 7, line 47-48). Arjunan teaches that the composition is useful in tire components and has good impermeability to gas (col. 1, lines 55-64).

While Arjunan teaches the use of clay as filler, it fails to disclose that the clay is a nanoclay used to form a nanocomposite.

Elpass discloses elastomer nanocomposites and teaches that layered clay minerals are used to improved mechanical properties as well as the air permeability of elastomers (col. 1, lines 23-25 and 61-67). The layered clay minerals are organically modified (col. 2, lines 33-58) and are present in an amount of 1-25 wt % (col. 3, lines 1-10). The nanocomposites are used in tire inner liners (col. 3, lines 2-37).

Given that Arjunan discloses the addition of clay and further given that organically-modified clay used to prepare nanocomposites is advantageous for gas impermeable products

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such as tire inner liners as taught by Elpass, it would have been obvious to one of ordinary skill in the art to utilize the organically-modified clay of Elpass in the composition taught by Arjunan to prepare a nanocomposite with improved mechanical and gas permeability properties.

Response to Arguments

9. Applicant's arguments have been fully considered but are moot in view of the new grounds of rejection set forth above.

Conclusion

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Vickey Nerangis whose telephone number is (571) 272-2701. The examiner can normally be reached on Monday - Friday, 8:30 a.m. - 5:00 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu can be reached on (571) 272-1114. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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/Vickey Nerangis/

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